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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/734,950	12/11/2000	Cecilia Y. Mak	005621	3444

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EXAMINER
TRAN, BINH X

ART UNIT	PAPER NUMBER
1765	

DATE MAILED: 06/19/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/734,950	MAK ET AL.
	Examiner	Art Unit
	Binh X Tran	1765

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 February 2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-113* is/are pending in the application.

4a) Of the above claim(s) *89-97* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-88 and 98-113* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☒ Claim(s) *1-113* are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *4,7,9* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of Group I (claims 1-89, 98-113) in Paper No. 10 is acknowledged. The traversal is on the ground(s) that the apparatus as amended will be overcome the examiner's basis for restriction for previous office action (i.e., the process as claimed can be practice by another materially different apparatus such as using a apparatus without a robot in a transfer chamber). This is not found persuasive because the apparatus as claimed can be use to practice another and materially different process such as a process without the step of forming a light propagating channel.

The requirement is still deemed proper and is therefore made FINAL.

2. Claims 89-97 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in Paper No. 10.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 9, 69 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to

reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

In claim 9, 69 the applicants claim, "wherein the core material comprises PSG, GeO_2, SiON, Si_3N_4 and silicon". The examiner cannot find the support for this limitation in the specification. The examiner interprets this claim requires the core material including all of the following components: PSG, GeO_2, SiON, Si_3N_4 and silicon. The examiner is able to find that the core material PSG (page 17, line 14-15). The examiner also is able to find the support for individual component. However, the examiner is unable to find the support that the core material must comprise every single component disclose above. For the purpose of examination, the examiner will interpret that the core material comprises any one of the above component.

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claim 10, 28, 32, 46-49, 61-63, 66-68, 83-86, 98-105 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 10, 28, 46, 83-86, 105 are indefinite for the use of improper Markush language. The examiner suggests to replace with "selected from the group of" to -- selected from the group consisting of-- (emphasis added).

Claims 47-49 are indefinite because they directly or indirectly depend on indefinite claim 46.

Claim 32 is indefinite for the use of improper Markush language. The examiner suggests to replace with "selected from quartz, silica, or fused silica" to --selected from the group consisting of quartz, silica and fused silica-- (emphasis added).

Claims 61-63, 66 recite the limitation "the doped material" in claim 58. There is insufficient antecedent basis for this limitation in the claim. There are four different materials in claim 58: the substrate, lower cladding, core, and upper cladding. It is unclear from the claim what material the applicants wish to refer as the "doped material". Claims 66-68 are indefinite because they directly or indirectly depend on indefinite claim 61 and/or 63.

In line 3 of claim 98 "the substrate" lack antecedent basis because in line 2, applicants use the term "a flat panel". It is unclear from the claim whether the "flat panel" and the "substrate" are referring to the identical layer or not. Claims 99-105 are indefinite because they depend on indefinite claim 98.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

8. Claims 1-3, 6-8, 14, 18-19, 23, 27, 42-43, 57-58 are rejected under 35 U.S.C. 102(e) as being anticipated by Shioda (US 6,500,603).

Shioda disclose a method for forming a waveguide structure comprising:

forming a light propagating channel in a lower cladding (12) (See the first and the second drawing in Fig 2A);

filling the light propagating channel with a core material to form a core (13) (third drawing in Fig 2A, col. 5 lines 3-30);

forming an upper cladding (14) over the core (13) (Fig 2A).

Respect to claims 2-3, Shioda discloses the step of planarizing the core material (13) and the lower cladding (12) prior to form an upper cladding (14) using etching (Fig 2A). Respect to 6, Shioda discloses the lower cladding is a substrate. Respect to claims 7-8, Shioda discloses patterning and etching a light propagating channel in the lower cladding (col. 5 lines 13-20). Respect to claim 14, Shioda discloses the upper cladding (14) is formed by spin-coating or the like (col. 5 lines 24-28, read on "sol gel process"). Respect to claims 18-19, Shioda discloses the light propagating channel is formed in the lower cladding and a portion the lower cladding is disposed below the light propagating channel as well as the lower cladding is deposited to from a lower surface of the core.

Respect to claim 23, Shioda discloses that a portion of the lower cladding is disposed below the core (Fig 2A). However, Shioda does not explicitly disclose that the position of the lower cladding minimizes the effect of birefringence. However, since Shioda teaches the same method claimed, under the principle of inherency the invention is considered to be anticipated by Shioda.

Respect to claim 27, Shioda discloses the core is formed in the lower cladding and the upper cladding is formed adjacent the upper side of the core (Fig 2A).

Respect to claim 42, Shioda disclose the step of patterning and etching the core material (13) to define one or more core structure (col. 5 lines 17-24) as well as forming an upper cladding (14) on the core using a solution with spin-coating technique (read on "a sol gel process", col. 5 lines 24-30). Respect to claim 43, Shioda disclose the upper cladding (14) is forming by flowing a precursor solution over the core structure then heating to cure the precursor (col. 5 lines 24-30). Respect to claim 57, Shioda teaches to perform planarizing step before forming the upper cladding (Fig 2A, 3rd step to 5th step). The limitation of claim 58 has been discussed above.

9. Claims 1, 4-8, 13-19, 22-25, 27-30, 32-35, 37-43, 58, 70, 106-112 are rejected under 35 U.S.C. 102(e) as being anticipated by Xu et al. (US 6,306,563).

Respect to claim 1, Xu discloses a method for forming a waveguide structure comprising:

forming a light propagating channel (15) in a lower cladding (6) (Fig 24, col. 11 lines 52-60);

filling the light propagating channel with a core material to form a core (1) (Fig 25);

forming an upper cladding (2) over the core (1) (Fig 27, col. 12 lines 1-5).

Respect to claim 4, Xu discloses the lower cladding is deposited on a substrate (4). Respect to claim 5, Xu discloses the core material has a higher refractive index than the lower cladding (col. 31 lines 57-61, read on the lower cladding has a refractive

index lower than the core).). Respect to claim 6, the examiner can interpret the term "substrate" means the base in which some layer can formed over it. The examiner, therefore, will interpret that the lower cladding can act as the substrate.

Respect to claims 7-8, Xu discloses patterning and etching a light propagating channel in the lower cladding (Fig 24-25). Respect to claim 13, Xu discloses forming a pre-formed upper cladding (2) to the lower cladding and the core (Fig 26-Fig 28). Respect to claim 14, Xu discloses the upper cladding is formed using a spin coating process (col. 31 line 65 to col. 32 line 2, read on "sol gel process").

Respect to claims 15-16, Xu discloses the upper cladding is bonded to the core using polymerizable adhesive such as epoxy (col. 13 lines 11-35). Respect to claim 17, Xu teaches that the adhesive such as epoxy is part of the upper cladding. The examiner, therefore, interpret that the adhesive will have the same refractive index as the upper cladding. Respect to claims 18-19, Xu discloses the light propagating channel is formed in the lower cladding and a portion the lower cladding is disposed below the light propagating channel as well as the lower cladding is deposited to from a lower surface of the core (Fig 24-25, col. 11 lines 52-67).

Respect to claim 22, Xu does not explicitly disclose the adhesive is selected to have a refractive index suitable to minimize loss or scattering of light conduct through the core. However, since Xu teaches the same method claimed using the same material as the current invention, under the principle of inherency the invention is considered to be anticipated by Xu.

Respect to claim 23, Xu discloses that a portion of the lower cladding is disposed below the core (Fig 26). Xu does not explicitly disclose that the position of the lower cladding minimizes the effect of birefringence. However, since Xu teaches the same method claimed, under the principle of inherency the invention is considered to be anticipated by Xu.

Respect to claim 24, the examiner can interpret the term "substrate" means the base layer in which some layer can formed over it. The examiner, therefore, will interpret that the lower cladding can act as the substrate to defines a portion of the core. Respect to claim 25, Xu disclose the upper cladding is formed by disposing a layer (i.e. panel) over the substrate and the core material (8) (Fig 27). Respect to claim 27, Xu teaches the core is formed in the lower cladding and the upper cladding is formed adjacent the upper side of the core (Fig 27 or Fig 28). Respect to claim 28, Xu discloses the lower cladding, the core and the upper cladding are formed by spin coating process (col. 31 line 31 to col. 32 line 2; spin coating process read on "sol gel processing").

Respect to claim 29, Xu discloses the core material has a higher refractive index than the lower cladding (col. 31 lines 57-61). Xu further discloses the upper cladding is made from the same material used in the lower cladding (col. 31 lines 65-67). The examiner, therefore, will interpret that Xu implicitly discloses the core material has a refractive index higher than the refractive index of low and upper cladding.

Respect to claim 30, Xu discloses a method for forming a waveguide structure comprising:

depositing a lower cladding (6) on a substrate (Fig 23);

forming a light propagating channel (15) in a lower cladding (6) (Fig 24, col. 11 lines 52-60);

depositing the light propagating channel with a core material to form a core (1 or 8) (Fig 25);

bonding an upper cladding (2) to the upper surface of the lower cladding (6) and the core (8) (Fig 27, col. 12 lines 1-5).

Respect to claim 32, Xu discloses the substrate comprises a material selected from the group consisting of glass, silicon oxide (col. 12 lines 42-47, read on "silica"). Respect to claim 33, Xu disclose the upper cladding has optical properties for use as a cladding disposed adjacent to the core. The limitation of claim 34 has been discussed above. Respect to claim 35, Xu discloses the light propagating channel (15) is formed by patterning and etching the lower cladding using dry etch technique (Fig 23-24, col. 11 lines 52-59). Respect to claim 37, Xu discloses that the lower cladding thickness is greater than the high of the light propagating channel (Fig 25-26). Respect to claim 38, Xu discloses the lower cladding is deposited to a thickness equal to the height of the light propagating channel if desired (col. 11 lines 63-66). Respect to claims 39-40, Xu discloses the lower cladding layer is deposited to about 10 μm (col. 31 lines 50-54, read on greater than 8 μm). Respect to claim 41, Xu discloses flowing a precursor fluid (i.e., flow polymerizable material using a spin coating process) and curing the precursor fluid. Respect to claim 42, Xu discloses patterning and etching the core material to define one or more core structure (Fig 19-21). Respect to claim 43, Xu teaches to flow a polymer

composition using spin coating over the core structure the curing the polymer composition to form upper cladding.

Respect to claim 58, Xu discloses the steps of: forming a lower cladding; depositing a core material on the lower cladding; patterning and etching the core material; depositing upper cladding and heating treating (i.e. curing) the upper cladding in situ (Fig 15-22). Respect to claim 70, Xu teaches to cure the core layer by actinic radiation (read on "densifying the core"; col. 12 lines 1-2). Respect to claims 106-112, Xu teaches to cure the lower cladding, the core and upper cladding in situ following the deposition thereof (col. 8 lines 7-15, col. 11 line 67 to col. 12 line 10).

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

11. Claims 20-21, 71-72, 74, 87, 98 are rejected under 35 U.S.C. 103(a) as being unpatentable over Xu.

Respect to claims 20-21, Xu discloses the low cladding disposed below the core. Xu differ from the above claims by the specific distance value between the core and the low cladding. However, Xu discloses the thickness of the low cladding and core layer is a result effective variable. The result effective variable is commonly determined by routine experiment. The process of conducting routine experiments so as to produce an expected result is obvious to one of ordinary skill in the art. Hence, it would have been

obvious to one having ordinary skill in the art, at the time of invention, to perform routine experiment to obtain the different in thickness as an expected result.

Respect to claims 71, 98 Xu discloses all the step of positioning the panel, forming the lower cladding, densifying the lower cladding, forming the core layer and forming the upper cladding. Claims 71, 98 differ from Xu by further discloses three different chambers for processing all of the claimed steps. It would have been obvious to one having ordinary skill in the art, at the time of invention, to modify Xu by using three different chamber because it would reduce processing time without cleaning the chambers for cross contamination in each step. Respect to claim 72, Xu discloses the step of curing the upper cladding following the deposition.

Claim 74 differs from Xu by the specific utilization percentage value. Utilization percentage is result effective variable. The result effective variable is commonly determined by routine experiment. The process of conducting routine experiments so as to produce an expected result is obvious to one of ordinary skill in the art. Hence, it would have been obvious to one having ordinary skill in the art, at the time of invention, to perform routine experiment to obtain optimal values as an expected result.

Respect to claim 87, Xu teaches depositing and curing a lower cladding layer. The examiner, therefore, will interpret that the depositing and curing steps are performed on the same system.

12. Claims 9-11, 31, 60-69, 84-86, 99-102 are rejected under 35 U.S.C. 103(a) as being unpatentable over Xu in view of Nishimoto (US 5,408,569).

Respect to claim 9, 69, 85 Xu fails to disclose the core material comprises GeO_2. However, Xu discloses the core material comprises SiO_2 (col. 12 lines 39-41). In a optical waveguide method, Nishimoto discloses the core material comprise SiO_2 doped with GeO_2 (col. 3 lines 24-26). It would have been obvious to one having ordinary skill in the art, at the time of invention, to modify Xu in view of Nishimoto by using GeO_2 because it will enhance the refractive index.

Respect to claims 10, 31, 84 Nishimoto discloses the lower cladding is made of undoped SiO_2 (col. 3 lines 28-30; read on USG or undoped silica). Respect to claim 11, 60-61, 86 Nishimoto discloses the upper cladding comprises BPSG (col. 3 lines 30-35). It would have been obvious to one having ordinary skill in the art, at the time of invention, to modify Xu in view of Nishimoto by using undoped silica for the lower cladding and/or BPSG for upper cladding because it is easy and relative cheap to prepare. Respect to claim 99, Nishimoto teaches the lower cladding comprise undoped SiO_2 (USG) and the core comprise PSG (col. 3 lines 27-30 and lines 58-63).

The limitation of claim 62 has been discussed above (i.e., cladding material has a refractive index lower than the core material).

Respect to claim 63, Xu fails to disclose the doped film has a lower flow temperature than the core material. Nishimoto teaches the doped film (lower cladding) has a lower reflow point than the SiO_2 layer core material (col. 3 lines 35-50). It would have been obvious to one having ordinary skill in the art, at the time of invention, to modify Xu in view of Nishimoto by having a lower flow temperature for the doped film

because it will allow us to have a large diameter substrate having small propagation loss.

Respect to claims 64-65, 100 Nishimoto teaches a rapid thermal process for a single substrate. Respect to claim 66, Nishimoto teaches the thermal annealing process is sufficient to flow the doped material.

Claims 67-68, 101 differ from the cited prior arts by the specific temperature and annealing time. Temperature and annealing time are result effective variables. The result effective variables are commonly determined by routine experiment. The process of conducting routine experiments so as to produce an expected result is obvious to one of ordinary skill in the art. Hence, it would have been obvious to one having ordinary skill in the art, at the time of invention, to perform routine experiment to obtain optimal temperature and time as an expected result.

Respect to claims 102, Xu teaches performing a photolithograpy step on the substrate to define the core pattern (8) then depositing an upper cladding on the core pattern ant then curing (perform densification) in a curing chamber (col. 11 lines 5-30, Fig 18-Fig 22).

13. Claims 12, 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Xu in view of Ono et al. (US 6,553,164).

Respect to claims 12, 36, Xu fails to disclose the upper cladding and/or the core material is deposited by chemical vapor deposition (CVD). Ono teaches to deposit the core and the upper cladding is deposited using CVD technique (col. 7 lines 25-30 and 45-50). It would have been obvious to one having ordinary skill in the art, at the time of

invention, to modify Xu in view of Ono by using CVD because it is well known in the art and easy to perform.

14a. Claims 26, 44-56, 59, 73-81, 83 are rejected under 35 U.S.C. 103(a) as being unpatentable over Xu in view of Veligdan et al. (US 6,222,971).

14b. Claims 103-105 are rejected under 35 U.S.C. 103(a) as being unpatentable over Xu and Nishimoto further in view of Veligdan.

Respect to claim 26, 83 Xu fails to disclose the panel is selected from the group consisting of quartz, silica, and fused silica. However, Xu clearly disclose the panel is made of polymer material. Veligdan teaches one can either use polymer or glass (aka silica) for the panel (col. 4 lines 52-57). It would have been obvious to one having ordinary skill in the art, at the time of invention, to modify Xu in view of Veligdan by using silica for the panel because equivalent and substitution of one for the other would produce an expected result.

Claims 44, 103 differ from Xu by the specific area of the substrate/panel. Veligdan discloses the substrate/panel area is a result effective variable base on height and width. Veligdan further discloses the height of 100 cm and width of 133 cm (area = 100 x 133 = 13, 300 cm^2; col. 3 lines 25-45, read on applicant's range). The result effective variable is commonly determined by routine experiment. The process of conducting routine experiments so as to produce an expected result is obvious to one of ordinary skill in the art. Hence, it would have been obvious to one having ordinary skill in the art, at the time of invention to perform routine experiment to obtain optimal area as an expected result.

Respect to claims 45-46, Xu discloses putting one or more active/passive optical component such as splitter, coupler on the substrate (col. 24 lines 45-51). Respect to claims 47-48 both Xu and Veligdan discloses input/output connections between optical fiber and waveguide component.

Claims 49, 56 differ from Xu and Veligdan by the specific length of the input/output connections and utilization percentage. Length of the input/output connection and utilization percentage are result effective variables. The result effective variables are commonly determined by routine experiment. The process of conducting routine experiments so as to produce an expected result is obvious to one of ordinary skill in the art. Hence, it would have been obvious to one having ordinary skill in the art, at the time of invention, to perform routine experiment to obtain optimal length as an expected result. The limitation of clams 50-51 has been discussed above under Xu reference (See Xu col. 12 lines 42-55). The limitations of claims 52-55 have been discussed above.

Respect to claim 59, Xu fails to disclose repeating the depositing and treating steps for at least two cycles. However, Xu clearly teaches the steps of depositing and treating steps in order to form a waveguide. Veligdan teaches a panel comprises a plurality of waveguide. In order to form a display with plurality of waveguide, the step of depositing and treating must be repeated multiple times. It would have been obvious to one having ordinary skill in the art, at the time of invention, to modify Xu in view of Veligdan by repeating the above two steps because it will help us to create a multi-clad display.

Respect to claims 73, Veligdan teaches a glass panel define one or more dice having ore or more optical device (such as optical waveguide) having a dimension of 133 cm x 100 cm. It would have been obvious to one having ordinary skill in the art, at the time of invention, to modify Xu in view of Veligdan by having a glass panel define the one or more dice and the dice have optical device it will help us to create a multi-clad display.

The limitation of claims 74-75, 80-81, 104-105 has been discussed above. Respect to claim 76, Veligdan teaches the dice comprise optical device (waveguide) having the shape similar to the panel. Since the dice and the substrate have the similar shape, they should have the same form factor (claim 78).

Respect to claim 77, Xu teaches the deposition step requires a curing step (i.e., densitification). It would have been obvious to one having ordinary skill in the art, at the time of invention, to deposit and curing in a separate chamber because it create more control and reduce processing time.

Respect to claim 79, Veligdan teaches the waveguides (dice having optical device) are stacked to gather to form a optical panel (Fig 2, read on "parallel...are formed").

15. Claim 82 is rejected under 35 U.S.C. 103(a) as being unpatentable over Xu in view of Gessel (US 5,396,351).

Xu fails to disclose the glass panel is a TFT (thin film transistor) panel. Gessel teaches the glass panel is a TFT. It would have been obvious to one having ordinary

skill in the art, at the time of invention, to modify Xu in view of Gessel by having TFT panel because the TFT exit high quality images with better contrast.

16. Claim 88 is rejected under 35 U.S.C. 103(a) as being unpatentable over Xu in view of Hornbeck et al. (US 6,282,358).

Xu discloses the step of depositing a core material. However, Xu fail to discloses the core material is deposited by a damascene process. Hornbeck teaches using a damascene process for forming a waveguide with a core layer. It would have been obvious to one having ordinary skill in the art, at the time of invention, to modify Xu in view of Hornbeck by using damascene process because it easy and relative cheap to perform.

17. Claim 113 is rejected under 35 U.S.C. 103(a) as being unpatentable over Xu in view of Veldhuis et al. (US 6,377,716)

Xu fails to disclose the step of depositing an encapsulation layer over the upper cladding. Veldhuis teaches the to deposit an encapsulating layer (low polymer) over the upper cladding (Fig 1). It would have been obvious to one having ordinary skill in the art, at the time of invention, to modify Xu in view of Veldhuis by forming encapsulation layer because it will protect the upper cladding

Conclusion

18. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Binh X Tran whose telephone number is (703) 308-1867. The examiner can normally be reached on Monday-Thursday and every other Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Benjamin L Utech can be reached on (703) 308-3836. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Binh X. Tran
June 13, 2003

BENJAMIN L. UTECH
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700